In the Claims

1. **(Currently amended)** A system for transferring fluid between a vessel and a microfluidic device, the system comprising:

a vessel capable of holding a fluid, the vessel having at least one substantially nonplanar external wall defining a first aperture therein; and

a microfluidic device having a first port;

wherein the microfluidic device is adaptably attached to the vessel by co-locating the first port with the first aperture such that fluid can flow between the vessel and the microfluidic device through the co-located first aperture and first port.

2. **(Original)** The system of claim 1 wherein the microfluidic device is flexible.

3. **(Original)** The system of claim 1 wherein the microfluidic device is made with sandwiched stencils.

4. **(Original)** The system of claim 3 wherein at least one stencil is made of a polymeric material.

5. **(Original)** The system of claim 3 wherein the microfluidic device includes multiple layers, and at least one layer is a self-adhesive tape.

6. **(Original)** The system of claim 5 wherein at least one layer of self-adhesive tape is self-adhesive on both sides.

7. **(Original)** The system of claim 5 wherein the microfluidic device adaptably attaches to the vessel with self-adhesive tape.

8. **(Original)** The system of claim 1 wherein following attachment the microfluidic device may be removed substantially intact from the vessel.

9. **(Original)** The system of claim 1 wherein fluid flows from the vessel into the microfluidic device.

10. **(Original)** The system of claim 1 wherein fluid flows from the microfluidic device into the vessel.

11. **(Original)** The system of claim 1 wherein the vessel contains a continuous flow of fluid.

12. **(Original)** The system of claim 1 wherein the microfluidic device has a vent.

13. **(Original)** The system of claim 12 wherein the vent is an air-permeable membrane that inhibits the passage of liquid.

14. **(Original)** The system of claim 1 wherein the microfluidic device has a second port such that fluid can flow within the microfluidic device from the first port to the second port.

15. **(Currently amended)** The system of claim 14, wherein a second aperture is defined in [[a]] an external wall of the vessel, and the second port is co-located with the second

aperture such that fluid can flow between the vessel and the microfluidic device through the co-located second port and second aperture.

16. **(Original)** The system of claim 1 wherein the vessel is selected from the group consisting of: a pipe, a tube, a vial, and a syringe.

17. **(Original)** The system of claim 1 wherein the vessel is cylindrical and includes a moveable piston sealingly engaged therein.

18. **(Original)** The system of claim 1 wherein the microfluidic device comprises a stencil continuously wrapped around the vessel.

19. **(Original)** The system of claim 18 wherein the continuously wrapped stencil is self-adhesive.

20. **(Original)** The system of claim 18 wherein at least a portion of the vessel is cylindrical in shape.

21. **(Original)** The system of claim 18 wherein the vessel is a syringe.

22. **(Original)** The system of claim 1 wherein the microfluidic device is a rewindable flexible device.

23. **(Original)** The system of claim 22 wherein the microfluidic device is composed of sandwiched stencils.

24. **(Original)** The system of claim 23 wherein the device includes an internal cover layer and an external cover layer.

25. **(Original)** The system of claim 22 wherein the vessel has a circumference, the microfluidic device has a length, and the unwound length of the microfluidic device exceeds the circumference of the vessel.

26. **(Currently amended)** The ~~device~~ system of claim 1 wherein the microfluidic device is used to detect the presence of at least one chemical or biological material in the fluid.

27. **(Currently amended)** The ~~device~~ system of claim 1 wherein the microfluidic device is used to sense at least one physical property of the fluid.

28. **(Currently amended)** The ~~device~~ system of claim 27 wherein the at least one physical property is selected from the group consisting of: temperature, pressure, differential pressure, and flow.

29. **(Currently amended)** The ~~device~~ system of claim 11 wherein the vessel ~~and the fluid are utilized in~~ comprises a bioreactor vessel.

30. **(Currently amended)** A method for transferring fluid between a vessel and a microfluidic device, the method comprising the steps of:

providing a vessel capable of holding fluid, the vessel having at least one substantially nonplanar external wall defining a first aperture therein;

providing a microfluidic device having a first port and being adapted to contour to the vessel adjacent to the first aperture;

attaching the microfluidic device to the vessel such that the first port is co-located with the first aperture; and

causing fluid to flow between the vessel and the microfluidic device.

31. **(Original)** The method of claim 30 wherein fluid is caused to flow between the vessel and the microfluidic device by generating a pressure gradient between the vessel and the microfluidic device.

32. **(Original)** The method of claim 30, wherein the microfluidic device is flexible.

33. **(Original)** The method of claim 30 wherein the microfluidic device attaches to the vessel with an adhesive.

34. **(Original)** The method of claim 30 wherein the microfluidic device comprises a self-adhesive tape and wherein the microfluidic device attaches to the vessel with the self-adhesive tape.

35. **(Original)** The method of claim 30 wherein the microfluidic device is made with sandwiched stencils.

36. **(Original)** The method of claim 30 further comprising the step of venting any initial contents of the microfluidic device.

37. **(Original)** The method of claim 30 further comprising the step of removing the microfluidic device substantially intact from the vessel.

38. **(Original)** The method of claim 30 wherein fluid flows through the microfluidic device and at least a portion of the fluid is returned to the vessel.

39. **(Original)** The method of claim 30 wherein the microfluidic device has a second port such that fluid can flow within the microfluidic device from the first port to the second port.

40. **(Currently amended)** The method of claim 39, wherein a second aperture is defined in [[a]] an external wall of the vessel and the microfluidic device has a second port, the second aperture being co-located with the second port such that fluid can flow between the vessel and the microfluidic device through the co-located second aperture and second port.

41. **(Original)** The method of claim 30 wherein the vessel contains a continuous flow of fluid.

42. **(Original)** The method of claim 30 wherein the vessel is selected from the group consisting of: a pipe, a tube, a vial, and a syringe.

43. **(Original)** The method of claim 31 wherein the vessel is cylindrical and includes a moveable piston sealingly engaged therein.

44. **(Original)** A fluid sampling device comprising:

a cylindrical vessel capable of holding fluid, the vessel having a characteristic length and an interior wall that defines a first and a second radial aperture displaced from one another along the length of the vessel;

a first moveable plunger sealingly engaged to the interior wall of the vessel;

a second moveable plunger sealingly engaged to the interior wall of the vessel; and

a reservoir having an inlet port in fluid communication with the first aperture and having an outlet port in fluid communication with the second aperture;

wherein fluid is transferred from the vessel into the reservoir as the first and second plungers are translated outward from the vessel.

45. **(Original)** The device of claim 44, wherein the reservoir is a microfluidic reservoir.

46. **(Original)** The device of claim 45, wherein the microfluidic reservoir includes a microfluidic channel.

47. **(Original)** The device of claim 45, wherein the microfluidic reservoir is external to the vessel.

48. **(Original)** The device of claim 45, wherein the microfluidic reservoir is attached to the vessel.

49. **(Original)** The device of claim 44 wherein the first plunger and the second plunger are connected by a mechanical linkage.

50. **(Original)** The device of claim 48 wherein the mechanical linkage has a deadband.

51. **(Original)** The device of claim 44 wherein the first plunger and the second plunger are not physically connected.

52. **(Original)** The device of claim 44 wherein the vessel is a syringe.

53. **(Canceled)**

54. **(Canceled)**

55. **(Canceled)**

56. **(Canceled)**

57. **(Canceled)**

58. **(Canceled)**

59. **(Canceled)**

60. **(New)** The system of claim 1 wherein the vessel includes a substantially cylindrical portion having a central axis, the at least one substantially nonplanar external wall bounds the substantially cylindrical portion, and the first aperture is disposed substantially perpendicular to the central axis.

61. **(New)** The method of claim 30 wherein the vessel includes a substantially cylindrical portion having a central axis, the at least one substantially nonplanar external wall bounds the substantially cylindrical portion, and the first aperture is disposed substantially perpendicular to the central axis.